

Compact, Wavelength Stabilized Seed Source for Multi-Wavelength Lidar Applications, Phase I

Completed Technology Project (2009 - 2009)



Project Introduction

This SBIR Phase I effort proposes to establish the feasibility of developing a compact, high performance laser source for integration into the next generation seed laser system for high stability, multi-wavelength lidar applications such as NASA Langley's HSRL program. Combination of the high performance laser source together with ADVR's integrated Planar Lightwave Circuit (PLC) technology will provide the electro-optic control signals required for precise locking of the seed source to a reference wavelength. A next generation seed laser system which incorporates the PLC concept, together with improvements in the source laser technology will advance NASA's lidar systems due to its compact, efficient, and reliable design, thus enabling use on small aircraft and space based platforms. The focus of the Phase II effort will be the optimization and integration of this technology into the next generation HSLR seed laser system with > a 50% reduction in weight, size and cost.

Anticipated Benefits

In addition to NASA's use in various lidar systems, the combination of a compact, low cost, single wavelength laser, together with PLC technology will find use in fiber and free-space communications where rapid, moderate power phase modulation is required. This technology can also be applied for systems used for environmental and pollution monitoring and in stabilizing laser sources used for precision metrology. The primary customer is NASA Langley's High Spectral Resolution Lidar (HSRL) program for aerosol and cloud characterization. This system is being considered for the ACE lidar by NASA's ACE Science Working Group because of the higher information content it provides over backscatter lidar on key aerosol optical and microphysical properties. The proposed technology will find multiple uses in other NASA lidar remote sensing programs, such in altimetry and DIAL lidar where compact, low cost, stabilized single lasers are required, and also has potential application in spectroscopic measurement techniques.



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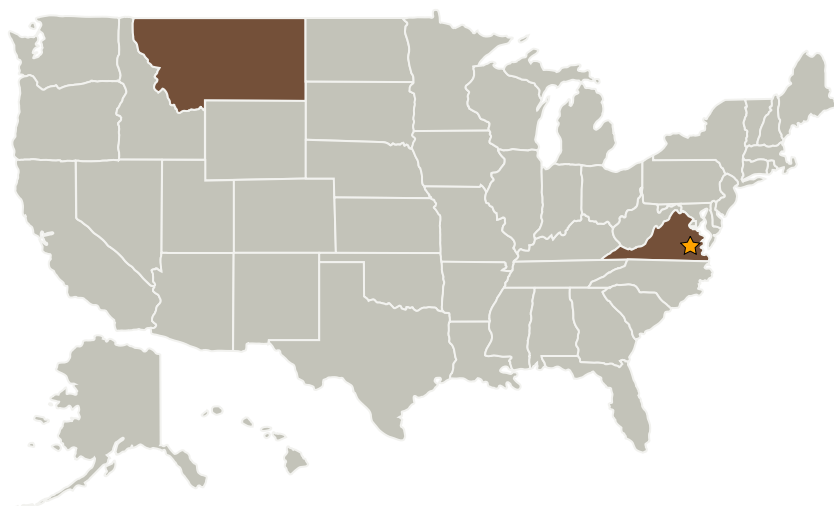
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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Langley Research Center (LaRC)	Lead Organization	NASA Center	Hampton, Virginia
ADVR, Inc.	Supporting Organization	Industry	Bozeman, Montana

Primary U.S. Work Locations	
Montana	Virginia

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Project Manager:

Anthony L Cook

Principal Investigator:

Shirley Mcneil

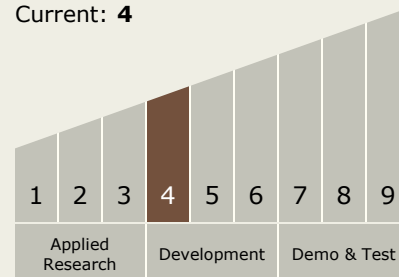
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Technology Maturity (TRL)

Start: 4
Current: 4



Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.5 Lasers